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22 OCT. 1918

Issued March 14, 1918.

# Hawaii Agricultural Experiment Station

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EXTENSION BULLETIN NO. 8

## EMERGENCY SERIES VI.

### BEAN SPOT DISEASE

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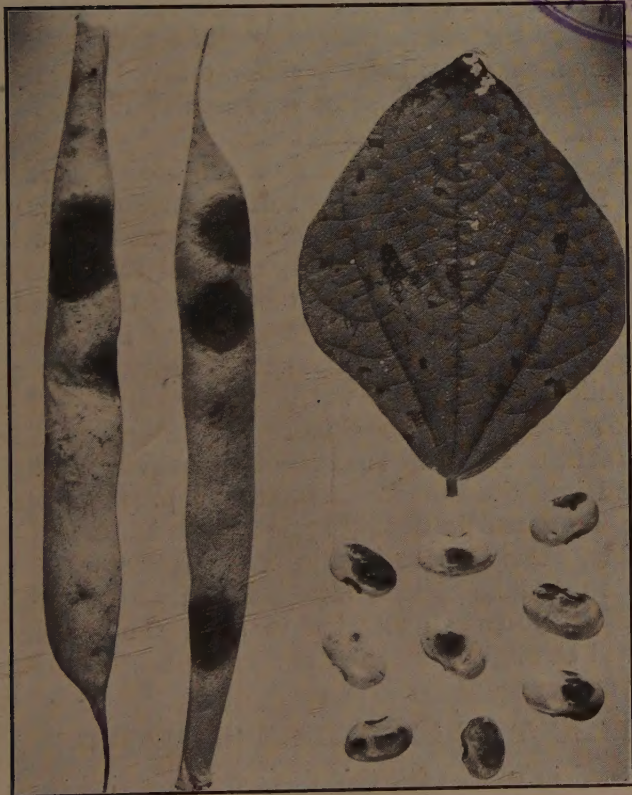
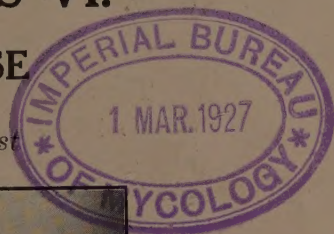


Figure 1. Canker spots on beans, leaf and pods.

## INTRODUCTION

It is estimated that the bean crop of the Islands is reduced at least 25 per cent by the spot disease known as anthracnose. The plants become yellow, drop their leaves, the pods are but partly filled, and many of the beans themselves are ruined by the disease spots or cankers. It is believed that the methods used for controlling this disease in other localities are applicable here. Any practicable measures which are likely to be instrumental in conserving this staple should be put into practice without delay.

## NATURE OF THE DISEASE

The signs of the disease are spots or cankers on leaves, stems, pods, and on the beans themselves. (See fig. 1.) The spots are small and purple or brown at first but they rapidly enlarge and become more or less reddish. The stems of young plants may rot a short distance above the ground. When cankers form on older stems the latter may crack open. The disease is caused by a fungus called *Glomerella lindemuthianum*, Shear.

The spores, or very small seed-like bodies, (see fig. 2) of the fungus are abundantly formed on the canker spots of leaf, stem or pod, and are carried from leaf to leaf or to pod by rain and the whipping about of the plant by the wind. Wet weather or heavy dews favor the growth and spread of the disease. Since the disease is spread most readily in wet weather it is not advisable to work the field while the plants are wet.

Badly affected pods are more or less deformed by the deep cankers and the fungus often grows through the pod and into the beans. Cankers and brown spots form on the beans and in drying some shrink and wrinkle considerably. The disease is carried from season to season and into new land by planting such seed. Seed which may not be badly enough affected to show the canker spots may still be slightly affected and carry the disease to the new crop.

## RESULT OF PLANTING DISEASED SEED

If seed infected with this disease be planted the plants as they come up bring the disease with them from the

seed. Usually only a part of the seed grows and the plants have spotted diseased leaves and cankered stems. The young plants may rot off and fall over. If the cankers on the stems are deep, the leaves become yellow and drop off. The whole field often becomes yellow.

If the plants be examined it will be found that the leaves and pods have reddish brown spots and that similar cankers are also on the stems. The pods may rot severely in wet weather. At picking time it will be found that the plants have not yielded well. Many of the pods are not filled and the beans are more or less cankered and unmarketable.

### HOW TO AVOID BEAN SPOT DISEASE

This disease can be avoided by planting seed from healthy plants on disease free soils. Select seed from healthy plants and from unspotted pods. Keep the seed from touching any diseased beans, old bean sacks, etc., and keep them away from the dust of the bean threshing. Use the seed to plant a seed plot on land free from this disease. If the seed has been carefully selected and handled the crop from the seed plot should be unusually free from disease. This disease free seed is kept for general planting.

The use of healthy seed on new land or on land that has not been in beans for several years offers a practicable means of controlling this disease in other localities and it is confidently expected will be of benefit here.

Spraying the plants early in the attack of this disease with Bordeaux mixture will probably give a measure of relief. Bordeaux mixture slightly weaker than recommended for Irish potatoes is advised. Such a mixture made by using one pound of Blue stone and one pound of quicklime to fifteen gallons of water should be satisfactory. Complete instructions for preparing standard Bordeaux mixture may be found in Extension Bulletin No. 4 of this Station entitled "Methods of Combating Garden Pests."

Seed disinfection though of some benefit is not to be relied upon since the fungus is inside the bean seed in most cases and out of reach of the fungicidal solution. Unless seed from healthy plants be used it would probably

more than pay for the trouble to select the seed carefully before planting and discard all misshapen, wrinkled or cankered beans, no matter how slight the disease spot may be. The selected seed may then be disinfected in a solution of formalin. Use one pint of formalin to thirty gallons of water (one ounce to two gallons, for a small quantity). Immerse the sack of selected seed in the solution for ten minutes; then pile the beans and cover with a tarpaulin or thick cloth for one hour; then spread the beans to dry.

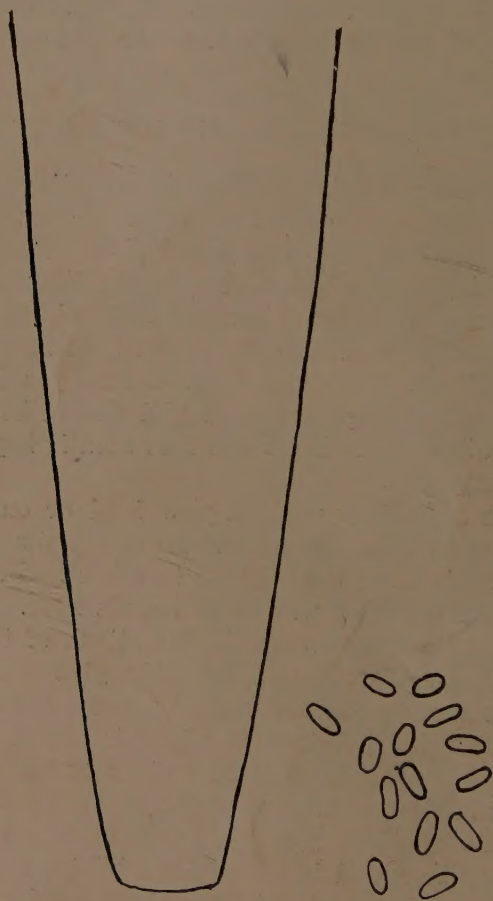


Figure 2. Spores of the bean spot disease fungus and the point of a rather small sewing needle magnified 400 times. At such a magnification the widest part of the needle would be ten inches across and therefore only about 1/100 of an inch of the needle point can be here represented.